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(54) Positioning a Flexible Pattern Casting Band in a Spectacle Lens Mount

(57) In a method of moulding a pattern within a lens mount opening 11 of a spectacle frame, a band 12 of thin, resilient sheet material is curled into a loop and fitted into the lens opening, in such a way that its ends overlap, and then forces are applied, by means of a complementary tool 7, to pins 1 and 2 at the ends of the band, to expand the band to fit closely within the lens mount opening and to bear against its periphery to cause the band

to conform exactly to the shape of the opening. The tool 7, spectacle frame and band are then laid on a flat-topped bench so that the lower longitudinal edge of the band lies closely against the bench surface, and a casting medium is poured into the cavity defined by the band and the bench surface. The pins 1 and 2 are disposed on opposite surfaces of the band 12 so that the two ends of the band can overlap closely. The tool 7 has the general form of a pair of pliers, with tubular members 1A and 2A at the ends of the limbs to engage over the pins 1 and 2.

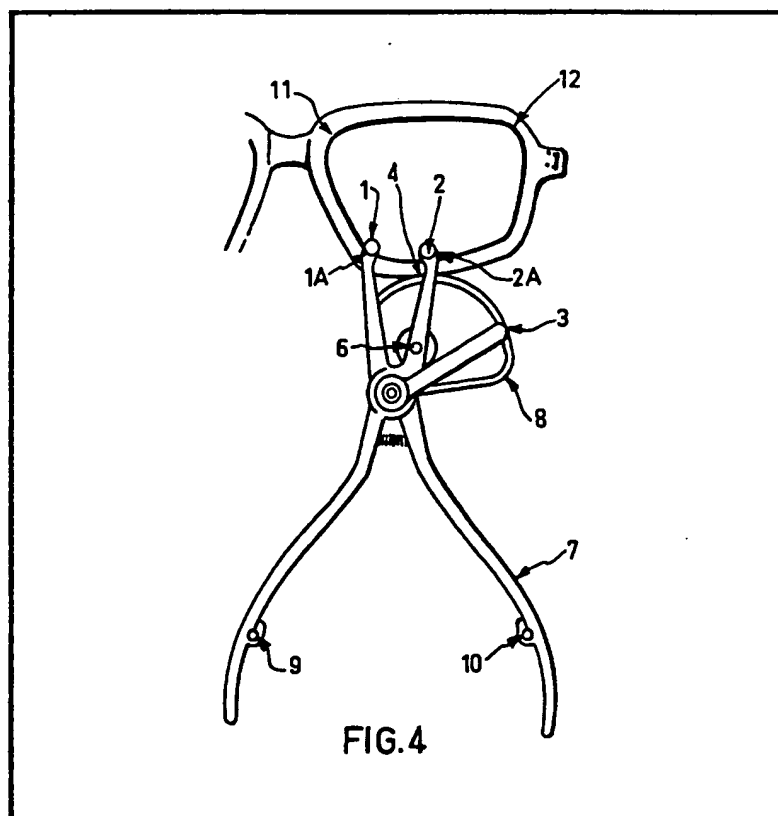


FIG. 4

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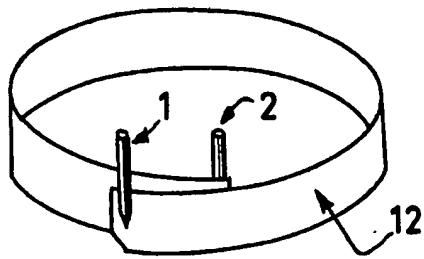


FIG. 1

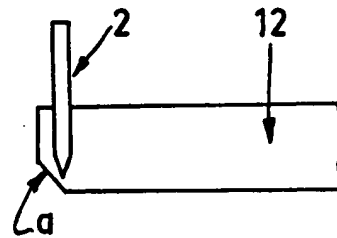


FIG. 2

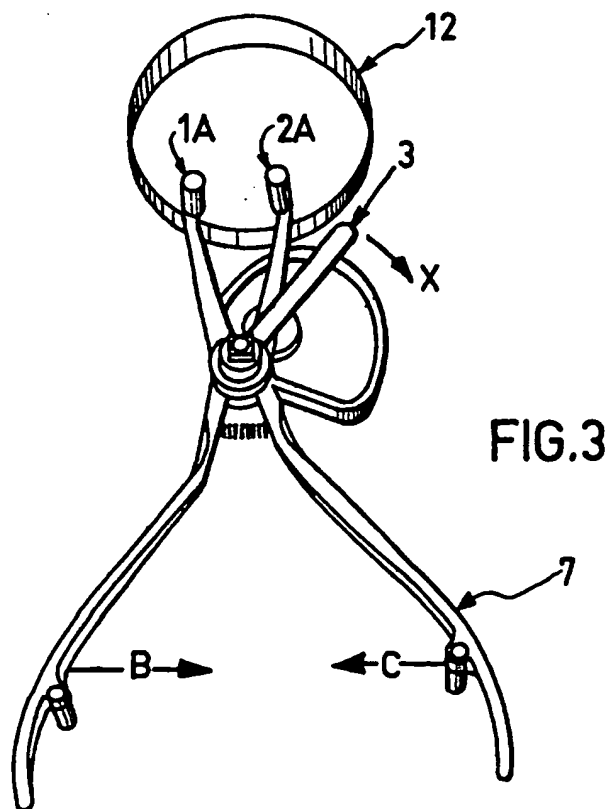


FIG. 3

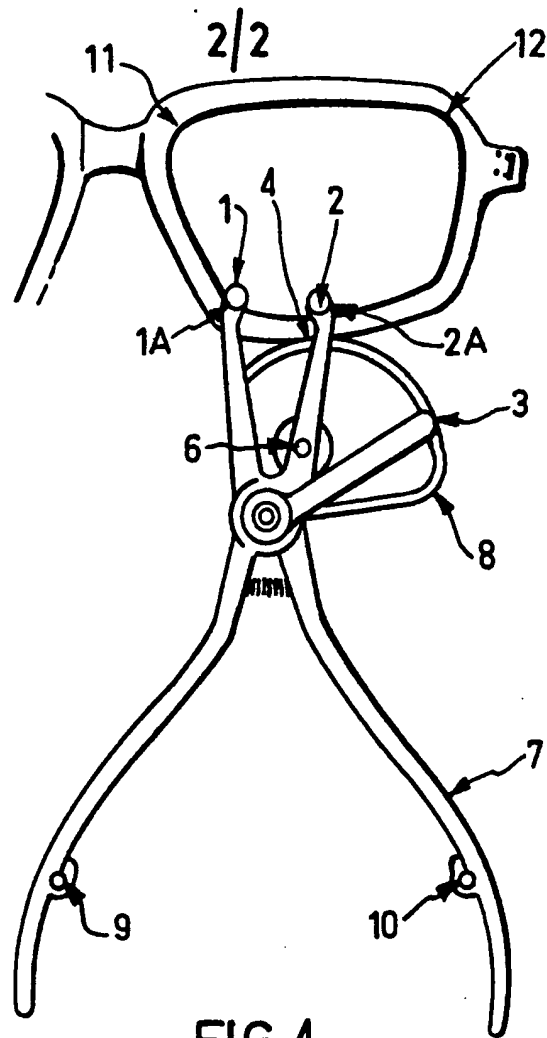


FIG. 4

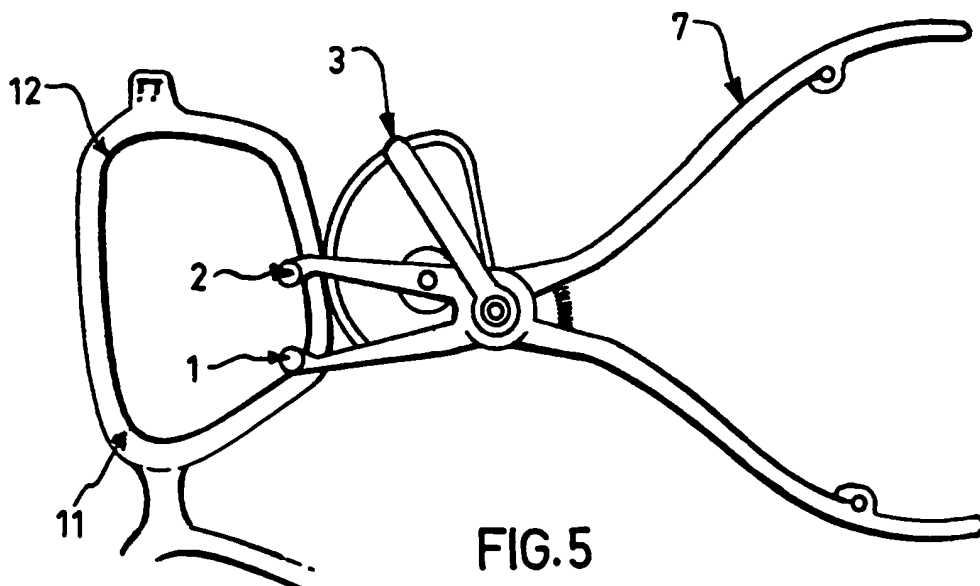


FIG.5

SPECIFICATION

Method and Apparatus for Positioning a Flexible Pattern Casting Band in a Spectacle Lens Mount

5 This invention relates to the moulding or casting within a lens mount opening of a spectacle frame, of a model or pattern, for use in a lens grinding machine.

In order to grind lenses that will fit a particular
10 spectacle frame, a model or pattern is needed. This is mounted in a standard piece of lens grinding equipment, and one lens for a pair of spectacles is ground; the pattern is then turned over, and used for grinding the other lens. Such
15 models or patterns are normally supplied by spectacle frame manufacturers, but there are so many of them that after a time an optician may lose track of them. A temporary customer may also have a frame for which an optician has no model. In such cases, the model is usually made
20 by hand, using a pre-model made of plastic or some other material. Various machines have been constructed to make models starting from the spectacle frame, but they appear to be rather unsatisfactory.

Other techniques are known, too, which are based on the casting of a quick-setting product inside the lens mounting. These techniques utilise
25 apparatus which may comprise working surfaces, with a spirit level or the like, rules, squares and graduated lines to allow the frame to be centred horizontally, means for holding the frame steady, as well as a thin flexible band, which is positioned inside the lens mount. U.S. Patent No. 3,228,070
30 granted August 25th, 1964 discloses such a technique and apparatus.

In the known techniques utilizing a thin flexible band, the lower edge of the band, which may be made from cold-hardened or tempered steel, is
40 laid on the flat surface of a bench, and it also engages as closely as possible the edge of the lens mount opening.

A quick-setting product is then poured into the lens mount, so as to present a thickness of a few
45 millimetres. The model, as cast, is provided with conveniently sized and positioned holes adapted to comply with the requirements defined by the structure of the lens-grinding machine. These holes may also form part of a component placed
50 in the centre of the lens mount prior to casting, and held firmly by the material cast about said component. This component can be recovered after the utilization of the model.

Failure of this method and apparatus results
55 mainly from the great difficulty of fitting the metal or other band tightly enough inside the lens mount opening.

It is an object of the invention to provide an improved method of moulding or casting a
60 pattern or model within a lens mount opening of a spectacle frame and to provide apparatus for carrying out the method.

According to one aspect of the invention there is provided a method of moulding a model or

65 pattern within a lens mount opening of a spectacle frame, comprising positioning and holding a band of thin resilient sheet material in a loop within the lens mount, with the ends of the band overlapping and at least one edge of the
70 band lying in a plane of the flat supporting surface engaging the same, and applying forces to the ends of the band by means of a tool to expand the band to fit closely within the lens mount opening and to bear against the periphery of the lens
75 mount opening in order to cause the band to conform exactly to the shape of the lens mount opening, and casting a pattern within the cavity defined between the band and said supporting surface.

80 According to another aspect of the invention there is provided apparatus for carrying out the method of the invention, including a band of thin resilient sheet material, the band having one longitudinal edge which, when the band is in a flat
85 and planar condition, extends in a straight line and the band having, extending beyond the other longitudinal edge thereof, at the ends of the panel, respective holdable component, the apparatus further comprising a tool for pressing
90 the band into place in a lens mount opening, the tool having two relatively movable members each having a respective holding formation engageable with a respective one of said holdable
components.

95 An embodiment of the invention is described below by way of example, with reference to the accompanying drawings, in which:—

Figure 1 is a perspective view of a thin, flexible band forming part of an apparatus embodying the
100 invention,

Figure 2 shows one end of this band to a larger scale,

Figure 3 is a perspective view of a tool forming part of the apparatus, with the band engaged
105 therewith,

Figure 4 is a plan view showing the tool in use holding the band inside a lens opening in a spectacle frame, and

Figure 5 is a view similar to Figure 4.

110 The method, to which the preferred embodiment to be described with reference to the drawings relates, of casting or moulding a pattern or model in the opening of a spectacle lens mount, utilizing a flexible band, differs from
115 known methods of this type principally in the construction of the band and the means used to press the band into place and hold it in place during the pouring of the quick-setting product.

Since the various stages of the manufacture of
120 a cast or moulded model or pattern, after the mould cavity has been defined are known from the prior art, the description of the preferred embodiment will be confined principally to describing the method and apparatus used to
125 afford a band positioned precisely and firmly inside a lens mount opening, in order to define, with a workbench surface, a moulding cavity in which it is possible to cast a pattern or model with substantially no flaws.

Referring to the drawings, Figure 1 shows a band 12 preferably made of thin resilient flexible steel sheet material adapted to fit inside the lens opening of a spectacle frame.

- 5 The band has two opposite, parallel longitudinal edges which, when the band is laid flat so that it lies in a plane, are straight edges. At opposite ends of the band are secured respective pins 1 and 2 which extend transversely away from one, lower, longitudinal edge of the band to project transversely, i.e. upwardly, beyond the other, upper, longitudinal edge of the band. In use, the band is curled into a loop as shown in Figure 1, with the ends of the band overlapping, and with the pin 1 disposed on the outside of the loop and the pin 2 on the inside, and the band is fitted in this condition within one of the lens mount openings of a spectacle frame.

- 20 The pin 1 on the outside of the loop formed by the band is fixed only to a portion thereof which extends near the upper edge of said band, so as not to prevent the band from fitting tightly against the peripheral edge of the lens mount opening. The two pins 1 and 2 form equal angles with the upper edge of the band, and becomes perpendicular to it only when the force necessary to press the band against the inside of the lens mount opening is applied.

- 30 Figure 2 shows the bottom half of the pin 2. This pin tapers at the bottom, and extends further downwardly, across the depth of the band, than the first pin.

- 35 This pin 2 must always be positioned inside the loop formed by the band, never outside. Its greater length allows it to press the end of the band more tightly against the outer part of the band, right to the bottom edge. The corner formed between the lower edge of the band and the end of the band at which 1 is disposed is bevelled at α . 40 The oblique corner α at the inner end of the band will leave an oblique trace of the band juncture on the model or pattern cast, but this will have little effect on the lens-grinding machine.

- 45 Even if the tapering end of the inner pin 2 touches the moulding substance, it will leave only a slight mark on the side of the model or pattern, which will have no effect on grinding operations.

- 50 The lower portion of each pin has a semi-circular cross section, the flat surface being the part in contact with the band. The two pins, though both fixed to the upper edge, are on opposite sides of the band, so that the overlap between the two ends of the band will be perfectly smooth.

- 55 Figure 3 shows a tool 7 having a general form similar to that of a pair of pliers comprising two elongate members pivotally connected intermediate their ends so that each comprises an upper arm or jaw and a lower arm or leg B, C. A spring acts between the legs B, C of the tool, adjacent the pivot pin, to urge the legs apart. The upper arms or jaws carry at their free ends respective tubular tips 1A and 2A, affording respective internal passages, extending 60 substantially parallel with the pivotal axis

between the jaws, and of a size to receive the pins 1 and 2. The tool also incorporates a brake lever 3 operable to restrain relative pivotal movement of the jaws and legs of the tool.

- 70 To fit the band 12 within a spectacle lens opening, the band is looped as shown in Figure 1 and the tips 1A and 2A are fitted over the pins 1 and 2 respectively.

- 75 When the legs B and C of the tool are gripped and moved closer together, this movement simultaneously moves the jaws or upper arms of the tool further apart and increases the distance between the pins 1 and 2, increasing the overlap between the ends of the band to decrease the circumference of the loop formed by the band, thus allowing the same to be introduced easily into the lens mount opening. When the gripping pressure on the tool arms is then released, the band expands elastically assisted by the spring acting between the legs of the tool and increases its circumference whereby it is pressed firmly against the peripheral edge of the lens mount opening to conform in shape therewith. When the operator considers that the band is properly 80 positioned and sufficiently tight, he presses the brake lever 3 with one finger, in the direction of the arrow X, locking the tool and keeping the band pressed right against the mount opening edge.

- 85 Figure 4 shows the position after the band 12 has been fitted into a lens opening in a spectacle frame 11, and the brake lever 3 has been pushed down. A pressing device 8 on the tool 7 presses in this position, adjustably against the point 4 of the frame closest to the tapering longer inner pin 2. This pressure on the frame forces the inner end of the band as tightly as possible against the outer part of the band, leaving as little as possible on the moulded model.

- 95 In the illustrated embodiment, the pressing device 8 is a cam, rotatable on a pivot-pin 6 on one arm of the tool 7. It will be appreciated that after the band 12 has been expanded satisfactorily within the lens mount opening, the cam 8 is rotated from a position out of engagement with the frame 11 until it engages the frame as shown in Figure 4.

- 100 Two feet 9 and 10 attached to the lower arms of the tool, keep it parallel with the surface of the bench when the assembly is placed there for the model to be cast. In the casting position, the lower edge of the band 12 engages, and is substantially co-planar with the planar work bench surface, so that the band defines, with this surface, an upwardly open moulding cavity.

- 105 A quick-setting product is then poured into this cavity, to a depth of a few millimetres, and allowed to set to form the desired pattern or model, before withdrawing the pattern, with the band, from the lens mount, and releasing the band from the pattern.

- 110 While the tool 7 has been described as taking a form in which movement of the legs B, C together moves the jaws apart to contract the band, it may, if preferred, take a form in which movement of the 120

legs B, C together moves the jaws together to expand the band. In the latter case, of course, it will be necessary to move the legs of the tool apart to contract the band prior to insertion in the lens mount opening.

Claims

1. A method of moulding a model or pattern within a lens mount opening of a spectacle frame, comprising positioning and holding a band of thin resilient sheet material in a loop within the lens mount, with the ends of the band overlapping, and at least one edge of the band lying in the plane of a flat supporting surface engaging the same, and applying forces to the ends of the band by means of a tool to expand the band to fit closely within the lens mount opening and to bear against the periphery of the lens mount opening in order to cause the band to conform exactly to the shape of the lens mount opening, and casting a pattern within the cavity defined between the band and said supporting surface.

2. Apparatus for use in carrying out the method of claim 1, including a band of thin resilient sheet material, the band having one longitudinal edge which, when the band is in a flat and planar condition, extends in a straight line and the band having, extending beyond the other longitudinal edge thereof, at the ends of the band, respective holdable component, the apparatus further comprising a tool for pressing the band into place in a lens mount opening, the tool having two relatively movable members each having a respective holding formation engageable with a respective one of said holdable components.

3. Apparatus as claimed in claim 2 wherein said tool comprises two pivotally connected arms each of said arms having at one end thereof a respective said holding formation.

4. Apparatus as claimed in claim 2 or claim 3 wherein said holdable components on the band comprise respective pins, attached to opposite surfaces of the band at opposite ends thereof.

5. Apparatus as claimed in claim 4, in which one of said pins extends substantially to said one longitudinal edge of the said band.

6. Apparatus as claimed in claim 5, in which, at the end of the band where said pin which extends substantially to said one longitudinal edge is located, the corner formed between the last-mentioned and said one longitudinal edge is bevelled.

7. Apparatus as claimed in claim 2 or claim 3, in which the tool used to press the band into place comprises a brake lever operable to restrain movement of said relatively movable members.

8. Apparatus as claimed in claim 3 or in any of claims 4 to 7 when dependent on claim 3, in which the tool used to press the band into place and hold it there comprises an eccentric component which revolves on a pivot-pin on one arm of the tool, and which is adapted in use to press against the outside edge of a lens mount.

9. Apparatus as claimed in claim 3 or any of claims 4 to 8 when dependent on claim 3 in which the tool used to press the band into place and hold it there comprises two elongate members pivotally connected intermediate their ends so that each comprises an upper arm bearing a respective said holding formation and a lower arm, with the upper and lower arms being on opposite sides of the pivot, and wherein the tool comprises a respective foot on each of its lower arms, said feet being adapted to hold the tool parallel with a planar supporting surface when the assembly comprising a spectacle frame, said band and said tool is placed on said surface, with said band held by its holdable components in said holding formations, in such a way that said longitudinal edge of the band makes substantially continuous contact with said supporting surface.

10. A method of moulding a model or pattern within a lens mount opening of a spectacle frame, substantially as hereinbefore described with reference to, and as shown in, the accompanying drawings.

11. Apparatus as claimed in claim 2 and substantially as hereinbefore described with reference to, and as shown in, the accompanying drawings.

12. Any novel feature or combination of features described herein.